

What is claimed is:

1. A fuel cell system comprising:
  - a fuel cell for generating power by being supplied with a fuel gas and an
  - 5 oxidizing gas;
  - a fuel gas supply path for supplying a fuel gas to the fuel cell;
  - a fuel off-gas circulation path for returning a fuel off-gas discharged from the
  - fuel cell to the fuel gas supply path;
  - an ejector, provided in the fuel gas supply path and driven by fluid flow energy,
  - 10 for supplying the fuel off-gas in the fuel off-gas circulation path flow to the fuel gas
  - supply path;
  - a fuel pump, provided in the fuel off-gas circulation path or on the fuel gas
  - supply path and downstream with respect to the ejector, and driven by a rotating machine,
  - for pressurizing the fuel off-gas;
  - 15 a discharge valve for discharging the fuel off-gas from the fuel off-gas
  - circulation path; and
  - a control device operatively connected to the fuel pump and to the discharge
  - valve.
- 20 2. A fuel cell system according to claim 1, further comprising a voltage measuring
- device, connected to the control device, for measuring voltage of cells constituting the
- fuel cell,
- wherein the control device is adapted to control the discharge valve so as to be
- opened and closed depending on the voltage of the cells measured by the voltage
- 25 measuring device.

3. A fuel cell system according to claim 1, further comprising a state-of-load measuring device, connected to the control device, for measuring a state-of-load of the fuel pump,

wherein the control device is adapted to control the discharge valve so as to be opened and closed depending on the state-of-load measured by the state-of-load measuring device.

4. A fuel cell system according to claim 2, further comprising a state-of-load measuring device, connected to the control device, for measuring a state-of-load of the fuel pump,

wherein the control device is adapted to control the discharge valve so as to be opened and closed depending on the state-of-load measured by the state-of-load measuring device.

5. A method for operating a fuel cell system which comprises: a fuel cell for generating power by being supplied with a fuel gas and an oxidizing gas; a fuel gas supply path for supplying a fuel gas to the fuel cell; a fuel off-gas circulation path for returning a fuel off-gas discharged from the fuel cell to the fuel gas supply path; an ejector, provided in the fuel gas supply path and driven by fluid flow energy, for supplying the fuel off-gas in the fuel off-gas circulation path flow to the fuel gas supply path; a fuel pump, provided in the fuel off-gas circulation path or on the fuel gas supply path and downstream with respect to the ejector, and driven by a rotating machine, for pressurizing the fuel off-gas; a discharge valve for discharging the fuel off-gas from the fuel off-gas circulation path; and a control device operatively connected to the fuel pump and to the discharge valve, the method comprising the steps of:

closing the discharge valve upon starting of the fuel cell; and  
operating the fuel pump when the discharge valve is in a closed state.

6. A method for operating a fuel cell system according to claim 5,

5 wherein the fuel cell system further comprises a voltage measuring device for  
measuring voltage of cells constituting the fuel cell, and

wherein the method further comprises the steps of:

opening the discharge valve when the voltage of the cells measured by the  
voltage measuring device is lower than or equal to a predetermined value when a

10 predetermined time has passed since the fuel cell is started; and

closing the discharge valve when the voltage of the cells exceeds the  
predetermined value after the discharge valve is opened.

7. A method for operating a fuel cell system according to claim 5,

15 wherein the fuel cell system further comprises a nitrogen concentration  
measuring device for measuring concentration of nitrogen contained in the fuel off-gas,  
and a voltage measuring device for measuring voltage of cells constituting the fuel cell,  
and

wherein the method further comprises the steps of:

20 opening the discharge valve when the concentration of nitrogen measured by the  
nitrogen concentration measuring device is greater than or equal to a predetermined value  
when a predetermined time has passed since the fuel cell is started; and

closing the discharge valve when the voltage of the cells exceeds a  
predetermined value after the discharge valve is opened.

8. A method for operating a fuel cell system according to claim 7, wherein the nitrogen concentration measuring device comprises a state-of-load measuring device for measuring a state-of-load of the fuel pump.